

IV. AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An expansion valve, in which a valve plug is driven by means of a temperature sensing unit which operates in accordance with the temperature and pressure of a low-pressure refrigerant delivered from an evaporator and adjusts the flow rate of refrigerant flowing into the evaporator, comprising:

constraint means for applying a force of constraint to the valve plug or an operating rod for opening and closing the valve plug, the constraint means being attached to the valve plug or the operating rod, wherein

the valve plug is spherical, and the constraint means is a support ring supporting the valve plug or the operating rod,

the support ring is formed of upper and lower circular annular portions and vibration-proof plate springs cut out of the annular portions and

each said vibration-proof spring is formed having a portion to be in pointed contact with the operating rod.

2. (Currently Amended) An expansion valve comprising:

a valve body having an orifice internally connecting a high-pressure passage through which a refrigerant flows in and a low-pressure passage through which the refrigerant flows out;

a valve plug for adjusting the flow rate of the refrigerant flowing in the orifice;

an operating rod for opening and closing the valve plug;

a temperature sensing drive unit for driving the operating rod; and

constraint means for constraining the valve plug or the operating rod, the constraint means being located on the upper-stream side of the high-pressure passage with respect to the orifice, wherein

the valve plug is spherical, and the constraint means is a support ring supporting the valve plug or the operating rod,

the support ring is formed of upper and lower circular annular portions and vibration-proof plate springs cut out of the annular portions and

each said vibration-proof spring is formed having a portion to be in pointed contact with the operating rod.

3. (Currently Amended) The expansion valve according to claim 1 or 2 or 23 or 27, wherein the constraint means is attached to the valve body.

4. (Currently Amended) The expansion valve according to claim 1 or 2 or 23 or 27, wherein the constraint means applies a force of constraint to the valve plug or the operating rod by means of elasticity.

5. (Canceled)

6. (Currently Amended) The expansion valve according to claim-51, wherein the support ring is formed of a circular annular portion capable of elastic deformation and vibration-proof springs, the springs supporting the valve plug or the operating rod.

7. (Canceled)

8. (Canceled)

9. (Original) The expansion valve according to claim 6, wherein each said vibration-proof spring is formed of a curved plate and supports the valve plug or the operating rod on a side face thereof.

10. (Currently Amended) The expansion valve according to claim-71, wherein each said vibration-proof spring is formed of a curved plate and supports the valve plug or the operating rod on a side face thereof.

11. The expansion valve according to claim-823, wherein each said vibration-proof spring is formed of a curved plate and supports the valve plug or the operating rod on a side face thereof.

12. (Canceled)

13. (Cancelled)

14. (Currently Amended) The expansion valve according to claim-121,
wherein the portion to be in pointed contact with the operating rod is hemispherical.

15. (Currently Amended) The expansion valve according to claim-121,
wherein the portion to be in pointed contact with the operating rod has a cylindrical
outer peripheral surface.

16. (Currently Amended) The expansion valve according to claim-121,
wherein the portion to be in pointed contact with the operating rod is in the form of a
ridge.

17. (Currently Amended) The expansion valve according to claim-1327,
wherein the portion to be in pointed contact with the operating rod is hemispherical.

18. (Currently Amended) The expansion valve according to claim-1327,
wherein the portion to be in pointed contact with the operating rod has a cylindrical
outer peripheral surface.

19. (Currently Amended) The expansion valve according to claim-1327,
wherein the portion to be in pointed contact with the operating rod is in the form of a
ridge.

20. (New) The expansion valve according to claim 2, wherein the portion to
be in pointed contact with the operating rod is hemispherical.

21. (New) The expansion valve according to claim 2, wherein the portion to
be in pointed contact with the operating rod has a cylindrical outer peripheral surface.

22. (New) The expansion valve according to claim 2, wherein the portion to be in pointed contact with the operating rod is in the form of a ridge.

23. (New) An expansion valve, in which a valve plug is driven by means of a temperature sensing unit which operates in accordance with the temperature and pressure of a low-pressure refrigerant delivered from an evaporator and adjusts the flow rate of refrigerant flowing into the evaporator, comprising:

constraint means for applying a force of constraint to the valve plug or an operating rod for opening and closing the valve plug, the constraint means being attached to the valve plug or the operating, wherein

the valve plug is spherical, and the constraint means is a support ring supporting the valve plug or the operating rod,

the support ring is formed of a circular annular portion and vibration-proof plate springs arranged on one side of the annular portion and

each said vibration-proof spring is formed having a portion to be in pointed contact with the operating rod.

24. (New) The expansion valve according to claim 23, wherein the portion to be in pointed contact with the operating rod is hemispherical.

25. (New) The expansion valve according to claim 23, wherein the portion to be in pointed contact with the operating rod has a cylindrical outer peripheral surface.

26. (New) The expansion valve according to claim 23, wherein the portion to be in pointed contact with the operating rod is in the form of a ridge.

27. (New) An expansion valve comprising:

a valve body having an orifice internally connecting a high-pressure passage through which a refrigerant flows in and a low-pressure passage through which the refrigerant flows out;

a valve plug for adjusting the flow rate of the refrigerant flowing in the orifice;

an operating rod for opening and closing the valve plug;
a temperature sensing drive unit for driving the operating rod; and
constraint means for constraining the valve plug or the operating rod, the
constraint means being located on the upper-stream side of the high-pressure
passage with respect to the orifice, wherein

the valve plug is spherical, and the constraint means is a support ring
supporting the valve plug or the operating rod,

the support ring is formed of a circular annular portion and vibration-proof
plate springs arranged on one side of the annular portion and

each said vibration-proof spring is formed having a portion to be in pointed
contact with the operating rod.

28. (New) An expansion valve, in which a valve plug is driven by means of a
temperature sensing unit which operates in accordance with the temperature and
pressure of a low-pressure refrigerant delivered from an evaporator and adjusts the
flow rate of refrigerant flowing into the evaporation, comprising:

constraint means for applying a force of constraint to an operating rod for
opening and closing the valve plug, the constraint means being attached to the
operating rod.

29. (New) The expansion valve according to claim 28, wherein the constraint
means is attached to the valve body.

30. (New) The expansion valve according to claim 28, wherein the constraint
means applies a force of constraint to the operating rod by means of elasticity.

31. (New) The expansion valve according to claim 28, wherein the constraint
means is a support ring supporting the operating rod.

32. (New) The expansion valve according to claim 31, wherein the supporting ring is formed of a circular annular portion capable of elastic deformation and vibration-proof springs, the springs supporting the operating rod.

33. (New) The expansion valve according to claim 31, wherein the support ring is formed of upper and lower circular annular portions and vibration-proof plate springs cut out of the annular portions.

34. (New) The expansion valve according to claim 31, wherein the support ring is formed of a circular annular portion and vibration-proof plate springs arranged on one side of the annular portion.

35. (New) The expansion valve according to claim 32, wherein each said vibration-proof spring is formed of a curved plate and supports the operating rod on a side face thereof.

36. (New) The expansion valve according to claim 33, wherein each said vibration-proof spring is formed of a curved plate and supports the operating rod on a side face thereof.

37. (New) The expansion valve according to claim 34, wherein each said vibration-proof spring is formed of a curved plate and supports the operating rod on a side face thereof.